



MINISTRY OF TRANSPORTS AND INFRASTRUCTURE  
ROMANIAN RAILWAY AUTHORITY - AFER

ROMANIAN RAILWAY INVESTIGATING BODY



## INVESTIGATING REPORT

On the fire occurred on the 2<sup>nd</sup> of November 2010 at the locomotive DA 60-0965-8, hauling the passenger train no. 1555-2, in the Branch of the Railway County Iasi, between the railway stations Bucecea – Veresti, at the km 13+500



Final edition  
The 20<sup>th</sup> of January 2011

## NOTICE

With reference to the railway accident occurred on the 2<sup>nd</sup> of November 2010, in the Branch of the Railway County Iasi, between the railway stations Bucecea and Veresti, at the km 13+500, consisting in the fire in the engine box of the locomotive DA 60-0965-8, hauling the passenger train no. 1555-2, Romanian Railway Investigating Body carried out an investigation, according to the provisions of the Government Decision no. 117/2010. Through the investigation, the information on the respective accident was gathered and analyzed, the conditions were established and the causes determined.

Romanian Railway Investigating Body investigation did not aim to establish the guilty or the responsibility in this situation.

Romanian Railway Investigating Body considers necessary to take corrective measures in order to improve the railway safety and to prevent the accidents, so it included in the report a series of safety recommendations

Bucharest, the    of January 2011

**Approved by,**  
Dragos Floroiu  
director

*I agree the compliance with the  
legal provisions on the  
investigation performance and  
drawing up of this Investigation  
Report, that **I submit for approval.***

**Chief Investigator**  
Sorin CONSTANTINESCU

***This approval is part of the Report for the investigation of the accident occurred on the 2<sup>nd</sup> of November 2010, in the Branch of the Railway County Iasi, between the railway stations Bucecea and Veresti, at the km 13+500, consisting in the fire in the engine box of the locomotive DA 60-0965-8, hauling the passenger train no. 1555-2.***

## **CONTENT**

### **I. Preamble**

#### **I.1. Introduction**

#### **I.2. Investigation process**

### **A. Brief presentation of the accident**

#### **A.1. Brief presentation**

#### **A.2. Direct, contributing factors and root causes**

##### A.2.1 Direct cause

##### A.2.2 Contributing factors

##### A.2.3 Underlying causes

##### A.2.4 Root causes

#### **A.3. Severity level**

#### **A.4 Safety recommendations**

### **B. Investigating report**

#### **B.1. Description of the accident**

#### **B.2. The accident circumstances**

##### B.2.1 Involved parties

##### B.2.2 Forming and equipments of the train

##### B.2.3 Railway equipments

##### B.2.4 Means of communications

#### **B.3. The consequences of the accident**

##### B.3.1 Deaths and injuries

##### B.3.2 Material damages

##### B.3.3 Consequences of the accident in the railway traffic

#### **B.4. External circumstances**

#### **B.5. Investigation course**

##### B.5.1 The summary of the of the involved railway staff statements

##### B.5.1.1 The summary of the of the railway undertaking and infrastructure manager staff statements

B.5.2 The safety management system

B.5.3 Norms and regulations. Sources and references for investigation

B.5.4 Work of the rolling stock

B.5.4.1 Data resulted from the inspections performed by the investigation commission and the staff in charge with the repair in Suceava Depot and recorded in the minutes ( part of the investigation file) and photos (taken by the investigation commission)

B.5.4.1.2 Data resulted from the analysis of the documents asked from the railway infrastructure manager

## **B.6. Analysis and conclusions**

B.6.1 Analysis of the incident occurrence

## **B.7. The accident causes**

B.7.1. Direct cause

B.7.2. Underlying cause

B.7.3. Root causes

## **C. Safety recommendations**



## **PREAMBLE**

### **1.1 Introduction**

The fire occurred on the 2<sup>nd</sup> of November 2010 at the locomotive DA 60-0965-8 of the train 1555-2 (structural sub-system – railway vehicle), is an accident according to art. 7, paragraph (1), letter e) from the ***Regulations for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety***, approved by Government Decision no. 117/2010, hereinafter referred as “***Regulations***” in the investigation report.

Taking into account those above mentioned and according to the art. 19, paragraph (20) from the *Law no. 55/2006 on the railway safety*, corroborated with the art. 48, paragraph (1) of the ***Regulations***, an investigation commission was appointed by Romanian Railway Investigating Body.

Through the investigation, the information on the respective accident was gathered and analyzed, the conditions were established and the causes determined.

Romanian Railway Investigating Body investigation did not aim to establish the guilty or the responsibility in this situation

### **1.2 Investigation process**

Soon after the accident, Romanian Railway Investigating Body was notified verbally and in written about it by CNCF “CFR” SA. At the accident place, it observed:

- the locomotive DA 60-0965, hauling the train no. 1555-2 from Botosani to Veresti, was stabled on the line 6 of the railway station Veresti;
- the locomotive box, on the left side to the driving cab 2, had the paint overheated on 1 square meter;
- in the engines box, the Argus pipes were carbonized;
- no damages at the lines and equipments in the accident area.

No deaths and injuries.

At the accident place were present the representatives:

- Inspectorate for Emergency Situations “Bucovina” from Suceava County, Firemen Point Suceava;
- Operative Department of Railway Transports Police;
- CNCF “CFR” SA;
- SNTFC “CFR Calatori” SA

So, through the Decisions of OIFR director, no. 36 from the 3<sup>rd</sup> of November 2010 and 36 bis from the 8<sup>th</sup> of November 2010, according to the provisions of the art. 19, paragraph (2) of the *Law no. 55/2006 on the railway safety*, corroborated with the art. 48(1) of the ***Regulations***, the investigation commission was appointed, consisting in:

- Groza Cristian - main investigator
- Dumitru Sfarlos - investigator
- Neculai SERBAN - territorial state inspector from Iasi State  
Inspectorate
- Ioan GADINARIU - Head of Safety Traffic Department – Railway  
Passenger County Iasi
- Flandorfer EDUARD - regional Inspector

## ACCIDENT RESUME

### A.1 Brief presentation

On the 2<sup>nd</sup> of November **2010**, the passenger train no. 1555-2 run between Botosani and Veresti, consisting in the locomotive DA 60-0965-8 and 3 compartment coaches. After the departure of the train 1552-2 from the railway station Bucecea, on the running line to the railway station Veresti, at the km 13+500, a fire occurred in the engine box of the locomotive, at the traction engine no. 5.



RAILWAY ACCIDENT PLACE

After the train stop, the driver being not able to bring under control completely the fire, he called 112 (emergency services), asking for the intervention of the Inspectorate for Emergency Situations. The fire was extinguished completely by the firemen from the Firemen Department Suceava, at 19,00 hour. The firemen intervention was on the running line, at the level crossing from the km 13+100 where the locomotive DA 60-0965-8 was hauled by the relief locomotive DHC 586, routed to the railway station Veresti.

The locomotive DA 60-0965-8, belongs to SNTFC “CFR Calatori” SA (engine shed Suceava) and with one driver.

The accident place is situated at the km 13+500 on the running line Bucecea – Veresti ( single unelectrified track ), the line is in embankment profile , alignment and 5,28 ‰ ramp in the running direction.

The accident place is on the track section Leorda – Veresti, belonging to CNCF “CFR” SA – Branch of the Railway County Iasi.

## **A.2 Accident causes**

### **A.2.1 Direct cause**

The fire was generated by a short circuit in the rotor winding of the electric ventilation motor of the bogie no. 2, followed by the expelling of overheated material through the ventilation holes of the electric ventilation motor and the ignition of the nearby oil products.

### **Contributing factors**

- presence of oil products in the constructive sealing areas of the equipments and of the diesel engine and their deposit in inaccessible areas;
- decrease of the insulation capacity of the dielectric material between the turns of the rotor winding of the electric ventilation motor from the bogie no. 2.

These factors were generated by the important wear from the locomotive equipments and units, because of the lack of compliance with the deadline established for the specific works type repair to which the locomotive is due ( due to repair type RG from September 2006).

### **A.2.2 Underlying cause**

Lack of some works in the maintenance of the locomotive with repair deadline exceeded, for the removal of the oil deposits (fuel, lubrication) in the constructive areas of the locomotives where they can appear.

### **A.2.3 Root cause**

None

## **A.3 Severity level**

According to the provisions of the ***Regulations***, the event is categorized as accident, in accordance with the art. 7, paragraph (1), letter e.

## **A.4 Safety recommendations**

The safety recommendations aim to solve the next issues:

- 1.compliance with the deadlines for the planned repairs of the locomotives;
- 2.periodical removal of the fuel and lubrication leaks from the locomotive areas inclined to casual fire, these works be included in the technological processes of the periodical inspections.

The addressee of the safety recommendations is SNTFC „CFR Calatori” SA Bucuresti.

This investigation report will be sent to Romanian Railway Safety Authority , to SNTFC „CFR Calatori” SA and the public railway infrastructure manager CNCF „CFR” SA.

## B. INVESTIGATING REPORT

### B.1 Accident presentation

On the 2<sup>nd</sup> of November 2010, around 17,05 hour, at the passenger train no. 1555-2, running between Botosani and Veresti, consisting in the locomotive DA 60-0965-8 and 3 compartment coaches, after passing through the railway station Bucecea on the running line to the railway station Veresti, at the km 13+500, a fire occurred in the engine box of the locomotive, at the traction engine no. 5, on the left side of the locomotive, in the running direction, the fire was followed by a lot of smoke. The locomotive engine stopped and then, during the checking, the driver observed a lot of smoke in the engine box.

After the train stop at the km 13+500, the driver together with some passengers, tried to bring under control the fire with the locomotive and coaches extinguishers, then they detached the locomotive and the coaches were hauled to the railway station Bucecea about 20 m, in order to prevent the fire expansion to those 3 coaches. The intervention with the extinguishers was on the outside of the locomotive box, at the engines 4 and 5.

The driver called 112 (emergency services), at around 17,10.

At 17,30 hour, the running line Veresti-Bucecea was closed and at 17,45 hour the locomotive DHC was routed from the railway station Veresti in order to haul the fired locomotive DA 60-0965-8 and hauled it to the level crossing from the km 13+100 in order to facilitate the firemen intervention. Starting with 18,20 hour, the military firemen from the Firemen Department Suceava started the procedures for the fire extinguishing, up to 19,00 hour.

No casualties.



At 20,47 hour, the running line Bucecea-Veresti was opened for traffic.

The accident place is situated at the km 13+500 on the running line Bucecea – Veresti ( single unelectrified track ), the line is in embankment profile , alignment and 5,28 ‰ ramp in the running direction.

The running line Leorda – Veresti is not electrified, and the train running is according the phone agreement, in the railway station Buceacea is used an equipment type SBW-CELS and in the railway station Veresti an equipment type CR3.



## **B.2 Accident circumstances**

### **B.2.1 Involved parties**

2.1.1 The involved staff belongs to SNTFC “CFR Calatori” SA, Railway Passenger County Iasi, Engine Shed Suceava.

2.1.2 The locomotive DA 60-0965-8 is owned by SNTFC “CFR Calatori” SA and maintained by the staff of the Section for the locomotive repair Suceava, belonging to SC “CFR – SCRL Brasov” SA.

2.1.3 The railway infrastructure, where the accident happened, belongs to CNCF “CFR” SA and maintained by the staff of the Track Section L5 Suceava.

2.1.4 The interlocking systems from the railway stations Bucecea and Veresti are managed by CNCF “CFR” SA – Branch of Railway County Iasi, maintained by the staff from the Track Section CT 3 Suceava.

2.1.5 The railway communication equipment from the railway stations Bucecea and Veresti is managed by CNCF “CFR” SA and maintained by the staff of SC TELECOMUNICATII CFR SA.

The investigation commission questioned the driver of the locomotive DA 60-0965-8, took statements from the guard and the passengers of the train 1555-2 involved in the fire bringing under control.

### **B.2.2 Train forming and equipments**

The train no. 1555-2 consisted in the locomotive DA 60-0965-8 and 3 coaches, with a driver .

The locomotive belongs to the railway undertaking SNTFC “CFR Calatori” SA. The safety and vigilance equipments (DSV), the equipment for the point control of the speed (INDUSI) of the locomotive were not affected by the fire.

### **B.2.3 Railway equipments**

The involved railway infrastructure, that is the running line between the railway stations Bucecea and Veresti is managed by CNCF “CFR” SA – Branch of the Railway County Iasi and maintained by the staff of the Track Section L5 Suceava.

The line is straight, consisting in rail type 49, re-enforced concrete sleepers T13. The running speed on the line Bucecea-Veresti is 80 km/h for the passenger trains and restricted to 30 km/h from the km 13+450 to the km 13+800.

The running line is not an electrified one.

### **B.2.4 Communication means**

The communication between the driver and the movements inspectors was ensured through radio-telephone equipments.

## **B.3 Accident consequences**

### **B.3.1 Deaths and injuries**

None

### **B.3.2 Material damages**

- at the locomotive DA 60 – 1527-7 **8502 lei;**  
according to the estimation no. 224/883/2010 of  
CFR SCRL Brasov- section for the locomotive repair Suceava
- train delays according to the estimation no. 623/1/458/2010 of SNTFC  
“CFR Calatori” SA, Railway Passenger County Iasi **2776,27 lei;**
  
- at the lines none;
- at the equipments none;
- at the environment none;

#### **Total**

**11278,27 lei**

### **B.3.3 Accident consequences for the railway traffic**

The running line, between Bucecea and Veresti was closed between the hours 17,30 and 20,47 for the intervention of the staff of the Inspectorate for Emergency Situations and stabling of the train in the railway station Veresti.

### **Train delays**

This accident led to the delay of 5 trains, totally 794 minutes.

## **B.4 External circumstances**

On the 2<sup>nd</sup> of November 2010, at the accident hour, the visibility was good, cloudless sky, windless, the temperature was about 10<sup>0</sup> C.

The accident happened in the area of the km 13+500, straight line, consisting in rail type 49, re-enforced concrete sleepers T1, welded track, with gradient 5,28‰, un-electrified single track.

The visibility of the light signals was in accordance with the specific regulations in force.

## **B.5 Investigation course**

### **B.5.1 Summary of the involved staff statements**

#### **B.5.1.1 Summary of the statements of the railway undertaking staff and of the witnesses.**

- the driver of the locomotive DA 60-0965-8 on the 2<sup>nd</sup> of November 2010 stated as follows:
  - normal driving conditions between Botosani and Bucecea;

- in the area of the km 13+500 the diesel engine of the locomotive stopped without a previous signalling of the control light or on INDA equipment display;
- he took measures for the train stop;
- he observed the fire start during the inspection of the engine box;
- he used, together with some passengers, extinguishers, trying to extinguish the fire;
- He could not extinguish the fire, at 17,10 hour he called 112 and asked for the military firemen intervention, mentioning the place and locomotive type

**The conductor on duty in the train 1555-2** on the 2<sup>nd</sup> of November 2010 stated as follows:

- he observed the smoke in the locomotive after about 5 km after the departure from the railway station Bucecea.

**Three witnesses** from the train 1555-2, on the 2<sup>nd</sup> of November 2010, stated as follows:

- few minutes after the departure from the railway station Bucecea, smelt smoke

### **B.5.2 Safety management system**

In order to fulfil their tasks and responsibilities, infrastructure manager CNCF “CFR” SA and the railway undertaking SNTFC “CFR Calatori” SA created and implemented their own safety management system, ensuring the control of the performed activity risks.

### **B.5.3 Norms and regulations. Sources and references for the investigation**

In the investigation of the railway accident one took into account :

- minutes concluded by the commission on spot, with reference to the condition of the rolling stock, lines and equipments;
- photos taken soon after the railway accident by the members of the investigation commission;
- statements of the fired locomotive driver, conductor and witnesses from the passenger train 1555-2;
- minutes concluded by the members of the investigation commission after the accident;
- documents on the locomotive maintenance and repair, provided by the persons in charge with its maintenance;
- inspection and interpretation of the technical condition of the elements involved in the accident:

- questioning of the staff in charge with the operation of the involved rolling stock.

#### **B.5.4 Work of the rolling stock**

##### **B.5.4.1 Data found out on the locomotive DA 60-0965-8:**

**B.5.4.1.1 Data resulted from the checking of the investigation commission and the repair staff from Suceava Depot and recorded in the minutes ( parts of the investigation file) and photos (taken by the investigation commission).**

Following the checking of the investigation commission at the locomotive, one found out:

- in the engine box, in the fire area
  - the aluminium platform had oil traces from the lack of tightness of the lubrication devices and fuel from the diesel engine work;
  - on the fastening support of the forced ventilation engine from the driving cab 2 there were oil traces;
  - signs of oil leakage at the base of the mechanical regulator, at the cylinder-head covers no. 11 and 12.
- at the auxiliary equipments:
  - the covers of the air filters from the driving cab left side (over the auxiliary pumps engine) are affected from thermic point of view;
  - the cable from water temperature probe, the cable from the level transducer of ICL equipment, the cable of the equipment for signalling and diagnosis type EPSAI are affected from the thermic point of view in the area over the engine of the auxiliary pumps;
  - the tubes Argus Ø80x1035 carbonized
- the box of the engine of the auxilliary pumps had some superficial traces of thermic affecting.
- forced ventilation engine series 129345/2001 of the bogie no. 2 had:
  - the connections from the brush ring carbonized;
  - the collector with heating traces;
  - traces of molten tin at the ends of the bars;
  - rotor shortcircuit observed through the hole in the rotor winding with expulsion of turns.



**The connections from the stator coil carbonized**



**Rotor shortcircuit observed through the hole in the rotor winding with expulsion of turns.**

- At the apparatus box
  - the fusibles for the forced ventilation – good condition;
  - the fusible for the auxiliary pumps engine – good condition ;
  - the switch for forced ventilation on „WINTER”.
- protection against currents on the engine, maximum voltage in the subsidiary circuits, body contact of the basic and subsidiary circuits through the Equipment for protection and signalling type INDA EPSAI 02.



- At the engine no. 4

the cover applied on the fire insulation of the power cables carbonized and in some places melted; the bellows from the ventilation chanel carbonized; the fastening frame of the cables in the box and the insulation sleeves of the fastening connections had superficial thermic affecting; there were no sign of unsuitable work.



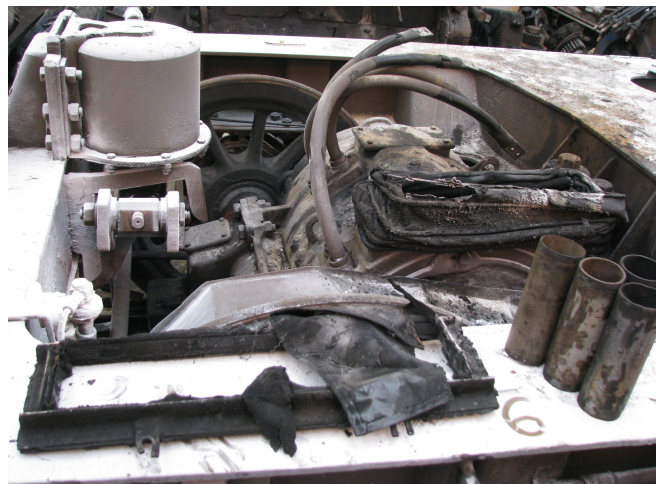
- At the engine no. 5

the cover applied on the fire insulation of the power cables carbonized and in some places melted; the bellows from the ventilation chanel carbonized; the fastening frame of the cables in the box and the insulation sleeves of the fastening connections carbonized; there were no sign of unsuitable work



- At the engine no. 6

the cover applied on the fire insulation of the power cables in good condition; the bellows from the ventilation chanel in suitable condition; the fastening frame of the cables in the





box and the insulation sleeves of the fastening connections carbonized;

there were no sign of unsuitable work

- on the locomotive box, left side to the driving cab 2, the paint is overheated on 1 square metre ;
- at the diesel engine, the fuel installation, supercharging installation of the engine, cooling installation of the engine, brake rigging and the other mechanical equipments, there were found no damage, distorsion or thermic affecting.

#### **B.5.4.1.2 Data resulted from the analysis of the documents asked from the railway undertaking**

- the locomotive DA 60-0965-8 was manufactured in 1974;
- the last planed repair was RR type in October 2002;
- the deadline for RG repair is September 2006;
- the last inspection was type RT and made by SCRL – Suceava Section, on the 20th of September 2010, in Suceava Depot;
- the last inspection type PTH3 was made in Suceava Depot, on the 31st of october 2010;
- Suceava Locomotive Repair Section could not submit to the investigation commission , the technical history of the engine that generated the fire, because of the lack of written records on this engine.

## B.6 Analysis and conclusions

### B.6.1 Analysis of the fire occurrence

The locomotive worked right at the departure from the railway station Bucecea at 17,01 hour, running up to 17,09,12 hour, when the electromotor of the ventilator from the bogie no. 2 , fails (according to the records of EPSAI locomotive equipment) . The failure of the ventilation electromotor consisted in a shortcircuit in the rotor winding, close to the connection between the rotor winding and the collector connections.



**Photo 1 – shortcircuit in the winding**

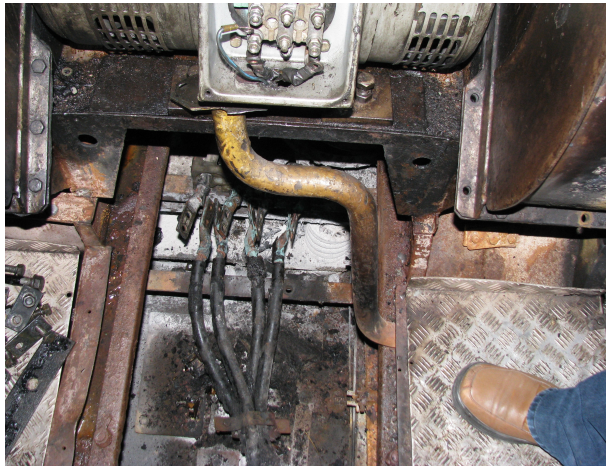
The shortcircuit occurred because of the diminuation of the dielectric resistance of the electric insulating material between the rotor turn winding.

After the shortcircuit, the diesel engine stopped without control, by the operation of the fuse 150, then the driver stopped the train at 17,10,03 ( according to the driver statements and to the records ICL, IVMS and EPSAI from the locomotive).

The shortcircuit generated:

- the overheating of the area and the expulsion of the ends of the rotor windings;
- the high heating of the tin from the rotor winding soldering of the winding ends connected to the collector;
- appearance of sparks and flame at the collector of the forced ventilation electromotor;
- evacuation out of the cover of the forced ventilation electromotor of molten material from the rotor winding (molten copper), tin drops and sparks.

The molten material from the rotor winding (molten copper), tin drops and sparks generated by the shortcircuit from the forced ventilation electromotor winding of the traction electro-motors from the bogie no. 2 of the locomotive, were sent out of the box of the forced ventilation electromotor, through the ventilation holes existing in the inspection covers of the collector (photo 2) and led to the ignition of the nearby oil, that were the initial centre of the fire.



From the initial centre the flames spread laterally to Argus tubes Ø80x1035 of the diesel engine lubrication equipment (made of reinforced rubber) and to the fuel (appeared in time during the locomotive work), being between the diesel engine and the forced ventilation electromotor of the traction electro-motors from the bogie 2 of the locomotive.

**Photo 2 – the ventilation holes of the inspection covers of the ventilation engine**

Starting from the initial centre, the flames spread also vertically up-down because of the fuel deposits (appeared in time during the locomotive work), to the traction electro-motors, where generated the fire of the bellows and the coverings applied on the fire insulation of the power cables of the traction electro-motors 4 and 5 of the locomotive.

The fire spread then :

- around the forced ventilation electromotor of the traction electro-motors from the locomotive bogie no. 2, between the diesel engine and the locomotive box, left side (photos 3,4,5);
- the connections from the ventilation channel of the traction electro-motors 4 (photo 6) and 5 (photo 7);
- The covering applied on the fire insulation of the power cables of the traction electro-motors 4 and 5 of the locomotive (photos 6,7).

In the engines box the fire was kept by the rubber of Argus tubes Ø80x1035 and by the oil drained through Argus tubes, from the lubrication equipment of diesel engine (photo 8).





**Photo 3 – the distance between the shield of the diesel engine and the fastening support of the forced ventilation electromotor**



**Photo 4 – the distance between the ventilator of the forced ventilation engine and the wall of the locomotive box (left side)**



**Photo 5 – the distance between the forced ventilation electromotor and the driving cab II of the locomotive**





**Photo 6 – the condition of the bellows and the power cables of the traction electromotor no. 4**



**Photo 7 the condition of the bellows and the power cables of the traction electromotor no. 4**



**Photo 8 Argus tubes, from the lubrication equipment of diesel engine after fire**

## **B.7 Accident causes**

### **B.7.1 Direct cause**

The fire was generated by a short circuit in the rotor winding of the electric ventilation motor of the bogie no. 2, followed by the expelling of overheated material through the ventilation holes of the electric ventilation motor and the ignition of the nearby oil products.

### **B.7.2 Contributing factors**

The non-performance in due time of the specific works type repair to which the locomotive was due (due to repair type RG from September 2006), led to an important wear of the locomotive equipments and units, generating:

- leakage of oil products in the constructive sealing areas of the equipments and of the diesel engine and their deposit in inaccessible areas;
- decrease of the insulation capacity of the dielectric material between the turns of the rotor winding of the ventilation traction engine from the bogie no. 2.
- presence of oil products in the constructive sealing areas of the equipments and of the diesel engine and their deposit in inaccessible areas;
- decrease of the insulation capacity of the dielectric material between the turns of the rotor winding of the electric ventilation motor from the bogie no. 2.

These factors were generated by the important wear from the locomotive equipments and units, because of the lack of compliance with the deadline established for the specific works type repair to which the locomotive is due ( due to repair type RG from September 2006).

### **B.7.3 Underlying cause**

Lack of some works in the maintenance of the locomotive with repair deadline exceeded, for the removal of the oil deposits (fuel, lubrication) in the constructive areas of the locomotives where they can appear.

### **B.7.4 Root cause**

None

## **C. Severity level**

According to the provisions of the *Regulations*, the event is categorized as accident, in accordance with the art. 7, paragraph (1), letter e.

## **A.4 Safety recommendations**

The safety recommendations aim to solve the next issues:

- 3.compliance with the deadlines for the planned repairs of the locomotives;



4. periodical removal of the fuel and lubrication leaks from the locomotive areas inclined to casual fire, these works be included in the technological processes of the periodical inspections.

The addressee of the safety recommendations is SNTFC „CFR Calatori” SA Bucuresti.

This investigation report will be sent to Romanian Railway Safety Authority , to SNTFC „CFR Calatori” SA and the public railway infrastructure manager CNCF „CFR” SA.

According to the provisions of the Law no. 55/2006 on the railway safety, Romanian Railway Safety Authority will monitor the implementation of these recommendations.

Members of the investigation commission:

- Groza Cristian - main investigator
- Dumitru Sfarlos - investigator
- Neculai SERBAN - member
- Ioan GADINARIU - member
- Flandorfer EDUARD - member